

## WEST Search History

DATE: Wednesday, December 10, 2003

**Set Name Query**

side by side

**Hit Count Set Name**

result set

*DB=USPT,PGPB,JPAB,EPAB,DWPI; THES=ASSIGNEE; PLUR=YES;  
OP=ADJ*

L4	powder\$5 near5 (drink or beverage) near5 (blueberry or cranberry or purple or red)	13	L4
L3	powder\$5 near5 (drink or beverage) near5 anthocyanin\$3	3	L3
L2	(anthocyanin or cranberr\$5 or bluberr\$5) same soy same (drink or beverage)	11	L2
L1	anthocyanin same powder\$5 same soy same (drink or beverage) same acid	2	L1

END OF SEARCH HISTORY

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DATE: Wednesday, December 10, 2003

<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
<i>DB=USPT,PGPB,JPAB,EPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ</i>			
L10	L9 and ((426/\$)!.CCLS.)	11	L10
L9	L2 and acid and (isolate or soy)	50	L9
L8	L7 and isolate.clm.	6	L8
L7	L2 and acid.clm.	72	L7
L6	L2 and soy.clm.	5	L6
L5	L4 and soy.clm.	3	L5
L4	L3 and acid.clm.	16	L4
L3	L2 and protein.clm.	28	L3
L2	anthocyanin.clm.	138	L2
L1	soy protein same anthocyanin same acid	2	L1

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<i>DB=USPT,PGPB,JPAB,EPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ</i>			
L14	L13 and soy isolate.clm.	1	L14
L13	L12 and acid.clm.	155	L13
L12	(cranberry or blueberry).clm.	335	L12
L11	(cranberry or blueberry) and acid and (soy or isolate)	738	L11
L10	L9 and ((426/\$)!.CCLS.)	11	L10
L9	L2 and acid and (isolate or soy)	50	L9
L8	L7 and isolate.clm.	6	L8
L7	L2 and acid.clm.	72	L7
L6	L2 and soy.clm.	5	L6
L5	L4 and soy.clm.	3	L5
L4	L3 and acid.clm.	16	L4
L3	L2 and protein.clm.	28	L3
L2	anthocyanin.clm.	138	L2
L1	soy protein same anthocyanin same acid	2	L1

END OF SEARCH HISTORY

**WEST****End of Result Set**

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L5: Entry 3 of 3

File: USPT

Aug 27, 2002

US-PAT-NO: 6440449

DOCUMENT-IDENTIFIER: US 6440449 B1

TITLE: Methods of infusing phytochemicals, nutraceuticals, and other compositions into food products

DATE-ISSUED: August 27, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hirschberg; Edward	Hillsborough	CA	94010	

US-CL-CURRENT: 424/439; 426/250, 426/426, 426/444, 426/455, 426/456, 426/465, 426/506, 426/640, 426/650

## CLAIMS:

What is claimed is:

1. A method of infusing a phytochemical, nutraceutical, flavor, or color composition into a food product, the method comprising: a. increasing brix of an osmotic dehydration solution comprising an osmotic dehydration solute and the food product over a period of time, wherein increasing brix is carried out by adding osmotic dehydration solute to the osmotic dehydration solution, replacing at least part of the osmotic dehydration solution, or a combination thereof, and b. incubating the food product with the phytochemical, nutraceutical, flavor, or color composition, thereby infusing the composition into the food product.
2. The method of claim 1, wherein the composition is a phytochemical.
3. The method of claim 1, wherein the composition is a nutraceutical.
4. The method of claim 1, wherein the food product is predried before infusing the composition into the food product.
5. The method of claim 1, wherein the solution comprises the composition.
6. The method of claim 1, comprising performing step (a) and step (b) separately.
7. The method of claim 1, comprising performing step (a) and step (b) simultaneously.
8. The method of claim 1, comprising varying the brix of the osmotic dehydration solution from about 20.degree. B. to about 80.degree. B.
9. The method of claim 1, comprising increasing the brix of the osmotic dehydration solution daily for a period of at least one week.

10. The method of claim 1, wherein the composition is a phytochemical or nutraceutical selected from: vitamins, minerals, isoflavoronals, lycopene, resveratol, indocarbonals, anthocyanins, soluble fiber, high protein rice, and soy isolate.
11. The method of claim 1, wherein the composition comprises a flavor, or a color.
12. The method of claim 1, wherein step (a) or step (b) is performed at room temperature.
13. The method of claim 1, wherein step (a) or step (b) is performed at about 50.degree. C., and the brix of the osmotic dehydration solution is about 77.degree. B.
14. The method of claim 1, further comprising stirring or circulating the osmotic dehydration solution, thereby increasing the rate of infusion of the composition into the food product.
15. The method of claim 1, wherein the food product comprises a strawberry and the brix of the osmotic dehydration solution is about 40.degree. B.
16. The method of claim 1, wherein the food product comprises a marionberry and the osmotic dehydration solution contains high fructose corn syrup (HFCS).
17. The method of claim 1, wherein the food product comprises fresh sliced carrot, and the brix of the osmotic dehydration solution is about 77.degree. B., said method further comprising heating the osmotic dehydration solution and incubating said solution overnight, wherein the composition comprises HFCS, Saw Palmetto, and Gingko Biloba.
18. The method of claim 1, further comprising coating the food product with a coating substance comprising gelatin, pectin, or starch to form a coated food product, and infusing the phytochemical into the coated food product.
19. The method of claim 1, wherein the osmotic dehydration solution comprising a dehydration solute selected from: high fructose corn syrup, dextrin, starch, gelatin, pectin, juice concentrate, and soy isolate.
20. The method of claim 19, further comprising heating the dehydration solute.
21. The method of claim 19, further comprising continuously circulating the dehydration solute.
22. The method of claim 19, further comprising circulating the dehydration solute and the food product through a tube or a pipe.
23. The method of claim 19, comprising passing the dehydration solute and the food product over a perforated conveyor, and collecting the food product therefrom.
24. The method of claim 1, further comprising pretreating the food product by freeze-drying the food product to 10% or lower residual moisture.
25. The method of claim 24, wherein the food product comprises a sliced cranberry, and the osmotic dehydration solution contains the phytochemical and HFCS, and the brix of the osmotic dehydration solution is about 77.degree. B.
26. The method of claim 24, wherein the food product is a vegetable selected from: carrot, and bell pepper, and the osmotic dehydration solution comprises dextrose and L-Carnitine.

27. The method of claim 1, said method further comprising removing excess water by drying a mixture of the food product and the composition after incubation of the food product with the composition in step (b).

28. The method of claim 27, wherein the food product is selected from: fruit, fruit juice, vegetable, vegetable juice, ground liver, chicken, and salmon.

29. The method of claim 27, wherein the food product comprises apple or carrot.

30. The method of claim 27, wherein the food product comprises a prune or a prune slice, and the composition comprises an herbal medicine.

31. The method of claim 27, wherein the food product comprises prune juice, and the composition comprises an herbal medicine.

32. The method of claim 1, wherein the composition is a medicinal capable of providing a medical or dietary benefit to a human.

33. The method of claim 1, wherein the composition is a medicinal capable of providing a medical or dietary benefit to a non-human animal.

34. A method of infusing a flavoring into a fruit or a vegetable, the method comprising: a. soaking the fruit or vegetable in a solution of potassium sorbate, calcium lactate, citric acid, glycerol, and the flavoring for at least three days; b. removing 20% of the solution by weight each successive day; c. replacing the removed solution with about 77.degree. B. brix HFCS until the brix of the solution reaches about 65.degree. B.; d. rinsing the solution off the fruit or vegetable; and e. drying the fruit or vegetable.

35. The method of claim 34, wherein the fruit is selected from: blueberry, strawberry, marionberry, and cranberry.

36. The method of claim 34, further comprising adding one or more of: anthocyanins, and vitamin C, to the solution.

**WEST****End of Result Set**

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L14: Entry 1 of 1

File: USPT

Aug 27, 2002

DOCUMENT-IDENTIFIER: US 6440449 B1

TITLE: Methods of infusing phytochemicals, nutraceuticals, and other compositions into food products

## CLAIMS:

10. The method of claim 1, wherein the composition is a phytochemical or nutraceutical selected from: vitamins, minerals, isoflavoronals, lycopene, resveratol, indocarbonals, anthocyanins, soluble fiber, high protein rice, and soy isolate.

19. The method of claim 1, wherein the osmotic dehydration solution comprising a dehydration solute selected from: high fructose corn syrup, dextrin, starch, gelatin, pectin, juice concentrate, and soy isolate.

25. The method of claim 24, wherein the food product comprises a sliced cranberry, and the osmotic dehydration solution contains the phytochemical and HFCS, and the brix of the osmotic dehydration solution is about 77.degree. B.

34. A method of infusing a flavoring into a fruit or a vegetable, the method comprising: a. soaking the fruit or vegetable in a solution of potassium sorbate, calcium lactate, citric acid, glycerol, and the flavoring for at least three days; b. removing 20% of the solution by weight each successive day; c. replacing the removed solution with about 77.degree. B. brix HFCS until the brix of the solution reaches about 65.degree. B.; d. rinsing the solution off the fruit or vegetable; and e. drying the fruit or vegetable.

35. The method of claim 34, wherein the fruit is selected from: blueberry, strawberry, marionberry, and cranberry.



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L10: Entry 6 of 11

File: USPT

Aug 27, 2002

DOCUMENT-IDENTIFIER: US 6440449 B1

TITLE: Methods of infusing phytochemicals, nutraceuticals, and other compositions into food products

Brief Summary Text (15):

In another aspect of the invention, when the food product includes fresh sliced carrot, and the brix of the osmotic dehydration solution is about 77.degree. B., the infusion method further includes heating the osmotic dehydration solution containing HFCS, Saw Palmetto, and Ginkgo Biloba, and incubating the solution overnight. Typically, the osmotic dehydration solution includes a dehydration solute such as high fructose corn syrup, dextrin, starch, gelatin, pectin, juice concentrate, or soy isolate. Optionally, the food product can be coated with a coating substance such as gelatin, pectin, or starch to form a coated food product, and the phytochemical is infused into the coated food product.

Brief Summary Text (17):

Compositions to be infused include can be phytochemicals, or nutraceuticals such as: vitamins, minerals, isoflavoronals, lycopene, resveratol, indocarbonals, anthocyanins, soluble fiber, high protein rice, soy isolate or others. Optionally, the composition to be infused can include a flavor, or a color. The food product is optionally a vegetable such as a carrot, or bell pepper, e.g., where the osmotic dehydration solution includes a low dextrose and L-Carnitine.

Brief Summary Text (20):

The mixture thus formed can be made into a trail mix, e.g., with at least two kinds of food products infused with phytochemicals. In a preferred embodiment, the mixture contains high protein rice, or soy isolate. In another preferred embodiment, the mixture is formed into a firm mass of material mixed with pectin or gelatin. Alternatively, the mixture is coated with a coating substance such as gelatin, pectin, or starch.

Brief Summary Text (21):

In a further aspect of the invention, a flavoring is infused into a fruit using the following steps: (a) soaking the fruit in a solution of potassium sorbate, calcium lactate, citric acid, glycerol, and the flavoring for at least three days; (b) removing 20% of the solution by weight each successive day; (c) replacing the removed solution with about 77.degree. B. brix HFCS until the brix of the solution reaches about 65.degree. B.; (d) rinsing the solution off the fruit or vegetable; and (e) drying the fruit or vegetable. The fruit typically includes, e.g., blueberry, strawberry, marionberry, cranberry, or the like. Optionally, anthocyanins, vitamin C, or other compounds are added to the solution.

Detailed Description Text (10):

The osmotic dehydration solution optionally includes any of a variety of vitamins, including vitamin A (e.g., vitamin A.sub.1, retinol, axerophthol, .alpha.-carotene, .beta.-carotene, .gamma.-carotene), B vitamins (e.g., B.sub.1 vitamins including: thiamin, aneurin, thiamine, pyrophosphate, cocarboxylase; B.sub.2 vitamins including riboflavin, vitamin G, lactoflavin, hepatoflavin, ovoflavin, verdoflavin, riboflavin mononucleotide, FMN, riboflavin dinucleotide, FAD), Vitamin C (ascorbic acid, antiscorbutic vitamin, dehydroascorbic acid), D (antirachitic vitamin, vitamin D.sub.2, D.sub.3, cholecalciferol, etc), Vitamin E, Vitamin K, and the like.

Detailed Description Text (13):

In one aspect, the present invention provides for fruits and vegetables with enhanced properties such as higher vitamin content, soluble fiber, amino acids, or the like.

Using the methods herein, it is possible to add fiber, vitamins, flavorings, preservatives, and the like, to most fruits and vegetables, as well as to many other foods. In one embodiment, it is desirable to fortify a fruit or vegetable with a vitamin naturally present in the vegetable, thus giving it superior nutritional value. For instance, a carrot can be fortified with vitamin A. In other embodiments, it is desirable to fortify the fruit or vegetable with vitamins, minerals, antioxidants, fiber or the like, which are not naturally present in the fruit or vegetable.

Detailed Description Text (23):

Food products can be formed into a particular shape, e.g., juice concentrate (e.g., from fruit or vegetable homogenate). For example, food products can be shaped into cubes, which can be of any geometric shape, which are then mixed with fruit or vegetable powders having phytochemicals. The mixtures are combined with high fructose corn syrup, and are then dried to form a final product consumed as a snack. Alternatively, the above juice concentrate can be mixed with high protein rice, or soy isolate before infusion with phytochemicals, and a different snack containing high protein rice or soy isolate can be manufactured following a similar process.

Detailed Description Text (31):

Blueberries are soaked with equal parts of water and solution containing potassium sorbate, calcium lactate, citric acid, glycerol and flavoring for 3 days. Each successive day, 20% of the solution by weight is removed and replaced with 77.degree. B. brix HFCS. This is continued until the brix reaches 65.degree. B. The blueberry solution is drained, the blueberries rinsed, oiled, and placed into trays and vacuum dried to desired dryness. Anthocyanins and vitamin C are added in early exchanges for enhancement.

Current US Cross Reference Classification (1):

426/250

Current US Cross Reference Classification (2):

426/426

Current US Cross Reference Classification (3):

426/444

Current US Cross Reference Classification (4):

426/455

Current US Cross Reference Classification (5):

426/456

Current US Cross Reference Classification (6):

426/465

Current US Cross Reference Classification (7):

426/506

Current US Cross Reference Classification (8):

426/640

Current US Cross Reference Classification (9):

426/650

CLAIMS:

10. The method of claim 1, wherein the composition is a phytochemical or nutraceutical selected from: vitamins, minerals, isoflavoronals, lycopene, resveratol, indocarbonals, anthocyanins, soluble fiber, high protein rice, and soy isolate.

19. The method of claim 1, wherein the osmotic dehydration solution comprising a dehydration solute selected from: high fructose corn syrup, dextrin, starch, gelatin, pectin, juice concentrate, and soy isolate.

34. A method of infusing a flavoring into a fruit or a vegetable, the method comprising: a. soaking the fruit or vegetable in a solution of potassium sorbate, calcium lactate, citric acid, glycerol, and the flavoring for at least three days; b. removing 20% of the solution by weight each successive day; c. replacing the removed solution with about 77.degree. B. brix HFCS until the brix of the solution reaches

about 65.degree. B.; d. rinsing the solution off the fruit or vegetable; and e. drying the fruit or vegetable.

36. The method of claim 34, further comprising adding one or more of: anthocyanins, and vitamin C, to the solution.